IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	REZNEK et al.	Examiner:	Lyle Alexander
Application Number:	10/649,347	Group Art Unit:	1797
Filed:	August 27, 2003	Confirmation No.:	4170
Docket No.:	CBK03072 (3600-374-22)	Customer No.:	95360

For: METHODS OF PROVIDING PRODUCT CONSISTENCY

APPEAL BRIEF
UNDER 37 C.F.R. § 41

Mail Stop **Appeal Brief — Patents**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

April 9, 2010

Sir:

(1) Identification

The appellants, application, and the Examiner's identification data associated with this paper are provided in the above-captioned heading.

The appellants hereby file an Appeal Brief under 37 C.F.R. § 41.37, together with the applicable fee under 37 C.F.R. § 41.20(b)(2).

A Notice of Appeal under 37 C.F.R. § 41.31 was previously filed with the applicable fee under § 41.20(b)(1) on February 16, 2010.

(2) Table of Contents

(3) Real Party in Interest

The real party in interest in this case is *Cabot Corporation*, the assignee of record.

(4) Related Appeals and Interferences

The appellants are aware of appeals in U.S. Patent Application Nos. 10/650,124 and 10/673,093, which the Honorable Board may consider to directly affect, be directly affected by, or have a bearing on the Board's decision in the present appeal.

(5) Status of Claims

Claims 4-6, 14, 20, 28, and 29 are canceled.

Claims 1-3, 7-13, 15-19, and 21-27 are rejected.

Claims 30-53 are withdrawn.

Claims 1-3, 7-13, 15-19, and 21-27 are on appeal.

(6) Status of Amendments

No amendment was filed subsequent to the final Office Action dated November 17, 2009.

(7) Summary of Claimed Subject Matter

I. Concise Explanation of the Subject Matter Defined in Independent Claims and Separately Argued Dependent Claims

a) Independent Claim 1

Independent claim 1 is directed to a method of providing product consistency for a particulate material (¶ [0008]: page 2, line 25; ¶ [0017]: page 5, lines 10-14), comprising the steps of:

a) maintaining at least one morphological value of a particulate material within a first target range (¶ [0008]: page 2, line 26 to page 3, line 1; ¶ [0057], page 20, lines 10-12, 16-18) and

b) maintaining at least one interfacial potential property value of the particulate material within a second target range (¶ [0008]: page 3, lines 1-2, 6-7; ¶ [0057], page 20, lines 10-12, 16-18), comprising:

i) determining at least one interfacial property value of the particulate material (¶ [0008]: page 3, lines 7-8; ¶ [0057], page 20, lines 13-14; and original claim 14, page 28, lines 16-17); and

ii) adjusting at least one process variable of a process for producing the particulate material, wherein the adjustment maintains the interfacial potential property value within the second target range (¶ [0008]: page 3, lines 8-11; ¶ [0056], page 19, lines 28-29; ¶ [0057], page 20, lines 15-16, 20-21; and original claim 14, page 28, lines 18-20), wherein said particulate material is a carbon black or silica (¶ [0037], page 12, lines 17-22; original claims 5 and 7, page 27, lines 13 and 15).

The present application provides definitions for the claim terms "maintaining" (¶ [0018]: page 5, lines 17-22), and "interfacial potential property value" (¶ [0041]: page 15, lines 1-2; ¶

[0024]: page 8, line 26 to page 9, line 3).

b) Dependent Claim 15

Dependent claim 15, which depends from claim 1, further specifies that the interfacial potential property value is determined during the process for producing the particulate material (¶ [0011]: page 4, lines 3-5; ¶ [0020]: page 6, lines 15-18; ¶ [0057], page 20, lines 18-19; and original claim 15, page 28, lines 21-22).

c) Dependent Claim 16

Dependent claim 16, which depends from claim 1, further specifies that the interfacial potential property value is determined prior to shipping the particulate material to a customer (¶ [0012]: page 4, lines 6-8; ¶ [0020]: page 6, lines 7-10; ¶ [0057], page 20, lines 21-22; and original claim 16, page 28, lines 23-24).

d) Dependent Claim 21

Dependent claim 21, which depends from claim 1, further specifies that the interfacial potential property value is determined by an interfacial potential absorptometry method comprising performing an absorptometer test on the particulate material with first and second different liquids and measuring maximum torque or volume of liquid added for the different liquids (¶ [0046]: page 16, lines 21-30; ¶ [0047], page 17, lines 1-9; ¶ [0062], page 21, lines 18-27; ¶ [0065], page 22, lines 22-32; ¶ [0067], page 23, lines 9-21; ¶ [0074], page 25, line 24 to page 26, line 5; and original claim 21, page 28, lines 13-14).

e) Dependent Claim 23

Dependent claim 23, which depends from claim 21, which further depends from claim 1, specifies that the absorptometry method uses water, ethylene glycol, or mixtures thereof. (¶ [0062], page 21, lines 18-27; ¶ [0065], page 22, lines 22-32; ¶ [0067], page 23, lines 9-21; ¶ [0074], page 25, line 24 to page 26,

line 5; and original claim 23, page 28, lines 17-18).

f) Dependent Claim 24

Dependent claim 24, which depends from claim 1, further specifies that the interfacial potential property value is determined by a wicking rate method comprising determining a difference in wicking rate for two or more liquids into equivalent packed columns of the particulate material (¶ [0048], page 17, lines 10-17; ¶ [0069], page 23, line 25 to page 24, line 22; and original claim 24, page 29, lines 19-20).

g) Dependent Claim 25

Dependent claim 25, which depends from claim 1, further specifies that the interfacial potential property value is determined by a yield point method comprising measuring a degree of flocculation of the particulate material (¶ [0049], page 17, lines 18-26; and original claim 25, page 29, line 21 to page 30, line 1).

h) Dependent Claim 26

Dependent claim 26, which depends from claim 1, further specifies that the interfacial potential property value is determined by a interfacial potential vapor adsorption method comprising using a gas for gas adsorption analysis, wherein said gas is selected from water gas, ammonia gas, toluene gas, or ethanol gas (¶ [0043], page 15, lines 17-29; ¶ [0053], page 18, lines 17-27; and original claim 26, page 30, lines 2-3).

i) Dependent Claim 27

Dependent claim 27, which depends from claim 1, further specifies that the interfacial potential property value is determined by an IGC method (¶ [0052], page 18, lines 9-16; and original claim 27, page 30, lines 4-5).

(8) Grounds of Rejection to be Reviewed on Appeal

1) Whether claims 1-3, 7-13, 15-19, and 21-27 are unpatentable under 35 U.S.C. §103(a) as being unpatentable U.S. Patent No. 6,800,413 B2 to Barthel et al. or U.S. Patent No. 6,348,539 B1 to Wideman et al.

(9) Argument

1. Rejection of claims 1-3, 7-13, 15-19 and 21-27 under 35 U.S.C. §103 over Barthel et al. (U.S. Patent No. 6,800,413) or Wideman et al. (U.S. Patent No. 6,348,539)

Claim 1

Claims 1-3, 7-13, 15-19 and 21-27 were finally rejected under 35 U.S.C. §103(a) over U.S. Patent No. 6,800,413 to Barthel et al. or U.S. Patent No. 6,348,539 to Wideman et al.[1]

The Examiner's Position

According to the final Office Action dated November 17, 2009 (pages 2-4), claims 1-3, 7-13, 15-19 and 21-27 are obvious over Barthel et al. or Wideman et al. for the following reasons:

The Examiner stated that Wideman et al. teaches a method of making a composition comprising carbon black, silica and metal oxide particles in specific size ranges. Torque and BET values, according to the Examiner, were monitored to determine the desired characteristics of the composition and read on the claimed combination of "morphological values" and "interfacial potential properties." The Examiner further stated that Barthel et al. shows a method of preparing carbon black and silica at the specific BET – method surface area (DIN 66131 and 66132) where these characteristics are determined by gas adsorption or inverse gas chromatography. The Examiner further stated that the taught BET of Barthel et al. has been read on the claimed combination of "morphological values" and "interfacial potential properties." The Examiner also stated that Barthel et al. and Wideman et al. are silent to the claimed ranges of the morphological values being within about 10%, the interfacial potential property value within about 50% and

[1] "Okado et al." is referenced by the Examiner at pages 3-4 of the Final Office Action. Okado et al. is not included in the Examiner's rejection statement. M.P.E.P. §706.02(j): "Where a reference is relied on to support a rejection, whether or not in a minor capacity, that reference should be positively included in the statement of the rejection. [citation omitted]"

adjusting the process variables to achieve the desired properties. The Examiner stated that In re Boesch (205 USPQ 215) decided that optimization of a result effective variable is ordinarily within the skill of the art. The Examiner also stated that in a manufacturing process, the selection of the acceptable range of the product is a result effective variable having the well known and predictable result of providing a product within the manufacturing specification. The Examiner also stated that the cited references are silent as to adjusting the process variable to achieve the desired characteristics of the particles and the specific testing by "wicking rate." The Examiner again referred to the In re Boesch decision and asserted that testing a particulate material by the speed or distance that the particulate solution "wicks" is notoriously well known in the art (e.g. for example paper chromatography) and that wicking tests are advantageous because they do not require sophisticated equipment and can be performed by the layperson.

The Examiner also added the following remarks in the final Office Action (pages 4-6) in support of this obviousness rejection:

The Examiner stated that the "8/26/09 Declaration" has been fully considered and does not have any factual data, but rather the opinions of "Dr. Sheldon" [sic]. The Examiner further stated the "8/26/09 Declaration" does not have sufficient probative value to overcome the rejections of record. The Examiner additionally stated that paragraph 5, line 3, of the 8/26/09 Declaration states that "Dr. Sheldon" is an "expert"; and the standard for patentability is "one of ordinary skill in the art" and, therefore, the opinions of an "expert" may not be relevant to the ultimate decision of patentability.

For the following reasons, the Appellants request review and reversal of this rejection.

The Appellants' Position

As recited in claim 1 on appeal, the present invention is directed to a method of providing

product consistency for a particulate material that is carbon black or silica, comprising the steps of: a) maintaining at least one morphological value of a particulate material within a first target range and b) maintaining at least one interfacial potential property value of the particulate material within a second target range. The step of maintaining the at least one interfacial potential property value comprises i) determining at least one interfacial property value of the particulate material; and ii) adjusting at least one process variable of a process for producing the particulate material, wherein the adjustment maintains the interfacial potential property value within the second target range.

As explained in the present application, and illustrated in more detail below, an interfacial potential property value, such as recited in claim 1 on appeal, is not a conventional morphological value used in specifying particulate material. The present invention is directed to resolving a problem associated with particulate material production in which materials that are seemingly made "within "spec" with respect to one or more measures of morphology, such as particles size, surface area, structure, porosity, etc., nonetheless do not perform consistently as expected in applications. Until now, the industry was not entirely clear why the product would not perform consistently even though the particulate material was within morphological specifications. Efforts to determine the source of such problems only after they emerge in products incorporating the particulate material are inefficient and often both time consuming and expensive. Trial-and-error approaches comparing the effects of adjustments made in the particulate manufacturing process with differences observed in the ultimate product containing the particulate material may resolve the product level problem within a limited context. However, such an approach does not provide a mechanism for intercepting problems at the particulate production level before problems arise in end products that incorporate the particulate material. The present inventors appreciated that the

problem of particulate materials that are "within spec," but perform inconsistently in application, ideally would be addressed as part of a quality control (QC) and/or quality assurance (QA) program implemented at the particulate production level, *before* end-products become involved. Moreover, the present inventors have developed a solution to the problem in this regard, which is reflected in their present claims. The present invention not only provides quality control and/or quality assurance for the particulate material but also makes it easier for a customer to obtain consistency in their end products and any intermediate products containing the particulate material, such as polymer products, and elastomeric products.

The concept of "interfacial potential" as used in the present invention is illustrated in the examples and figures of the present application. Several of these illustrations are discussed below in summary fashion to assist the Honorable Board's understanding of the present claims on appeal, which include this terminology or related terms, such as "interfacial potential property value." In this illustrative discussion of "interfacial potential," several of the selected tables from the examples, some of which are annotated to assist the discussion, and the figure, are included in the Evidence Appendix section of this Appeal Brief. For instance, Table 3 (Example 2: paragraph [0065]: page 22, lines 22-32) shows volume at maximum torque data taken on the same grade of carbon black from four manufacturing plants (↑31) as measured using four different liquids (↑32, ↑33, ↑34, ↑35). The terminology "same grade of carbon black" means the carbon blacks share compliance with some specified measure of morphology, such as "% of max DBP" (↑32) at volume at maximum torque in this example. As the data in Table 3 shows, the results in volumes for "% of max DBP" (↑32) are closely clustered, but those obtained for the other liquids (↑33, ↑34, ↑35) are not the same from manufacturing plant to manufacturing plant. This means that the interfacial potentials are <u>not the same</u> for the four samples and hence the products are <u>not the same</u>,

even though they were supposed to be uniform based on at least one morphological criterion. The cited art, such as Barthel et al. and Wideman et al., show no appreciation for this phenomenon and problem, which has been discovered and solved by the present inventors-appellants. Thus, the products would be better specified if at least one of these interfacial potential property values were included. Also illustrative, Table 4 (Example 3: paragraph [0067]: page 23, lines 7-21) shows data for a similar test as done for Example 2 (Table 3) except with a higher DBP specification carbon black (↑41), wherein the results show the volumes for "% of max DBP" (↑42) are closely clustered, but those obtained for the other liquids (↑43, ↑44, ↑45) are not always the same from manufacturing plant to manufacturing plant. This data in Table 4 also shows that the products would be better specified if at least one of these interfacial potential property values were included. The data shown in Table 5 (Example 4: paragraph [0069]: page 23, line 25 to page 24, line 21) includes upper rows (↓51), which shows that by the standard QA/QC values, the listed carbon blacks would appear to be all the same by the standard specification. However, when the interfacial potentials are measured by the rate of wicking of various liquids up a packed powder bed, as shown in lower rows (↑52), they differ in their interfacial potential values. A method of the present invention, which comprises assigning at least one interfacial potential property value, would be able to distinguish between them. The previous examples have used a single interfacial potential parameter from each test. However, combinations of multiple parameters can also be used in a method of the present claims on appeal. The data in Table 6 of the present application (Example 5: paragraph [0073]: page 25, lines 9-23) shows that carbon black samples CB-A to CB-E of the "same" grade would be considered identical by a person in the industry based only on the conventional morphological values, such as volume DBP or CDBP at maximum torque, iodine number, BET surface area, and STSA values, measured typically for the carbon black samples.

However, Figure 1 (paragraph [0074]: page 25, line 24 to page 26, line 5) illustrates that samples of the "same" grade of carbon black that were indicated to be the same by standard morphology tests are actually different from each other when tested with the absorptometry method using different test liquids than DBP. As shown in Figure 1, measurement of volume at maximum torque using only DBP (data points "■") misleadingly indicated that the various carbon black samples were the same. In actuality, the measurement of volume at maximum torque using water ("♦"), glycol ("▲"), 60/40 glycol/water ("●"), and paraffin oil ("◊"), shows data points that are significantly separated and not clustered together as with the DBP ("■") results. Therefore, these values show different carbon blacks and can be used to specify the desired carbon black. For example, the carbon black samples having the same morphological property can be measured for interfacial potential property value by the absorptometry measurement of volume of water (instead of DBP) at maximum torque to determine whether the results are separated (such as shown in Figure 1) as an indication that the samples are not actually the same when interfacial potential is accounted for, or not separated as an indication the samples are the same when interfacial potential is accounted for. As can be appreciated, the present invention essentially takes the specification of particulate material, such as carbon black, to a new higher level of specification and accuracy, which did not exist prior to the present invention.

The applicants have gone to great effort to assist the Examiner in explaining the particular measurements in claim 1 on appeal and have made repeated efforts to reference the paragraphs in the present application to ensure that the Examiner has a complete understanding of the test methods and the invention. In further support of these explanations, the Declaration under 37 C.F.R. §1.132 of Dr. Sheldon Davis (the "Davis Declaration") was submitted for the Examiner's consideration. A copy of the Davis Declaration is included in the Evidence Appendix of this Brief.

Dr. Davis would be considered a person that is highly knowledgeable in the relevant art. Several relevant portions of the Davis Declaration are referenced herein and should further assist the Board in understanding the differences between the present invention and the cited references.

As explained by Dr. Davis in his Declaration, Barthel et al. relates to low-silanol silicas that are designed for various uses including emphasis placed on their use in developers and toners, e.g., magnetic and nonmagnetic toners, used for printing/reproduction and image transfer processes (e.g., col. 11, line 43 to col. 12, line 29)(Davis Declaration, page 6, para. 9). As further explained by Dr. Davis, Barthel et al. describes silica that merely relate to physical or morphological properties of the product, such as toners, and that based on his personal first-hand knowledge and experience with carbon blacks and other particulate materials designed and used for print developers and toners, those materials have not been conventionally designed using concepts of an "interfacial potential" of the particles (as that terminology is defined in the present application), nor has any connection previously been made in the toner arts between interfacial property and quality control for end-product performance (Davis Declaration, page 6, para. 9). Further, Barthel et al. only relates to determining surface area by BET analysis according to standard methods DIN 66131 and 66132 (see col. 2, lines 53-55; col. 9, lines 30-34; col. 10, lines 16-26, 34-36, 45-48; col. 14, lines 22-24). As also explained by Dr. Davis, it is well known in the particulate material industry that measurement of gas adsorption by these DIN standards 66131 and 66132 involves measuring the adsorption of nitrogen or krypton as an "inert gas" (Davis Declaration, page 7, para. 10). BET analysis, as referenced in Barthel et al., provides only a measurement of surface area of particulate material. The indicated standards used for BET analysis in Barthel et al. do not provide a measurement of interfacial potential as further apparent from the evidence in paragraph [0043] of the present application. As explained by Dr. Davis in his Declaration, paragraph [0043]

(page 15) of the present application explains that "alternative gases" such as water, ammonia, and various organic vapors such as toluene and ethanol, instead of the "common 'inert' gases" of nitrogen or krypton, can be used for BET analysis for determining interfacial potential according to methods of the present invention (Davis Declaration, page 7, para. 10). Moreover, Barthel et al. does not teach or suggest how a standard BET analysis according to DIN 66131 and 66132 may be modified to provide a measure of interfacial potential as recited in the present claims, nor why there would be an apparent reason to attempt such a modification or that there would be a reasonable expectation of success for such a modification.

As also explained by Dr. Davis in his Declaration, Wideman et al. relates to use of silica as a filler for tire tread rubber, and measures surface area of the silica using a conventional BET method using nitrogen gas as a morphological property measurement (col. 4, lines 41-48) (Davis Declaration, page 8, para. 11). Torque is measured by Wideman et al. on *a compounded rubber sample* (col. 8, line 55 to col. 9, line 4) and not a particulate material itself as recited in claim 1 on appeal (Davis Declaration, page 8, para. 11). Therefore, the implementation of quality control at the filled product (compounded rubber) level, such as in Wideman et al., overlooks the potential serious problem of particulates made "within spec," which nonetheless perform inconsistently in applications (Davis Declaration, page 8, para. 11). Therefore, Wideman et al. does not teach or suggest any of the present claims.

Also, Barthel et al. and Wideman et al. do not teach or suggest that interfacial potential of carbon black or silica is a results-effective parameter. The Examiner has not identified in the final Office Action where any one of these references teach or suggest that measurement or its significance and utility. As the PTO specifically instructs in M.P.E.P. §2144.05 under the heading "Only Result-Effective Variables Can Be Optimized":

> A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) ...

The Examiner's reasons for this rejection repeatedly refer to morphological properties taught in the two relied upon references, which are different from an interfacial property as explained above and in the present application. Therefore, the Examiner's reliance on the In re Boesch case is not on point.

As described above and in the present application, "at least one morphological value" and "at least one interfacial potential property value" as defined are different from each other. Wideman et al. and Barthel et al. do not appreciate the importance of maintaining at least one interfacial potential property value of a filler within a target range, in addition to maintaining at least morphological value of the filler within a target range. In particular, Wideman et al. and Barthel et al. do not teach, suggest or predict success of the present method including the recited step of maintaining at least one interfacial potential property value of a particulate material that is carbon black or silica, comprising i) determining at least one interfacial property value of the particulate material; and ii) adjusting at least one process variable of a process for producing the particulate material, wherein the adjustment maintains the interfacial potential property value within the second target range. Further, present claim 1 on appeal recites that this method is applied to particulate material that is carbon black or silica.

As demonstrated in the working examples of the present application, morphological values can appear to indicate that a particulate material is within spec, while the added interfacial potential property measurements reveal that the particulates perform inconsistently. As discussed previously herein (and in the present application), implementation of quality control at the filled

product (compounded rubber) level, such as in Wideman et al., overlooks the potential serious problem of particulates made "within spec" which nonetheless perform inconsistently in applications. However, the method of the present invention provides product consistency by maintaining both at least one morphological value as well as at least one interfacial potential property value of the particulate material that is carbon black or silica. In this way, it has unexpectedly been found that product quality assurance (QA) and quality control (QC) are vastly improved if, along with measurements of morphology, measurements of values that reflect the interfacial potential of the particulate material are also made.

As also explained above, Wideman et al. measures surface area of silica using a conventional BET method as a morphological property measurement and torque is measured on *a compounded rubber sample,* and not a particulate material *per se* as recited in claim 1 on appeal. As also indicated, Barthel et al. does not teach or suggest how the standard BET analysis according to DIN 66131 and 66132, used only to measure surface area as a morphological property, may be modified to provide a measure of interfacial potential as defined in the present application. With respect to the Examiner's comments at page 5 of the final Office Action that Appellants' remarks submitted August 26, 2009 were not commensurate in scope with the pending claims because the specific limitations of paragraph [0043] are presently not claimed, the Examiner's reasoning is flawed. Appellants point out that, first, the claims clearly recite the determination of at least one interfacial potential value, and this can be done based on various methods, one of which can be the test described in paragraph [0043]. As explained, paragraph [0043] of the present application provides evidence that the DIN standards 66131 and 66132 used for BET analysis by Barthel et al. would not inherently provide a determination of at least one interfacial potential property value as required in the method recited in claim 1 on appeal. Barthel et al. and Wideman et al. simply do not

use a test that determines at least one interfacial potential value or the methods set forth in the claims to make any measurement or understanding of an interfacial property value and especially does not use any of this data to provide a method to determine product consistency as set forth in claim 1 of the present application. The Examiner appears to take the position that if the same word is found in the reference and the present application, such as "BET," this is sufficient for maintaining the rejection when, in fact, the reference as a whole must be considered and, further, the use of the particular measurement in the cited reference must be taken into consideration. Claim 1 on appeal of the present application does not merely recite measuring a BET value.

Further, the Examiner's disregarding of the opinions of "Dr. Sheldon" (i.e., Dr. Sheldon Davis) at pages 4-5 of the final Office Action because they are rendered by an "expert" and not "one of ordinary skill in the art" is contrary to law. As M.P.E.P. §2145 instructs:

> ... Rebuttal evidence may include evidence of "secondary considerations," ... It may also include evidence of the state of the art, the level of skill in the art, and the beliefs of those skilled in the art. See, e.g., *In re Oelrich,* 579 F.2d 86, 91-92, 198 USPQ 210, 214 (CCPA 1978) (Expert opinions regarding the level of skill in the art were probative of the Nonobviousness of the claimed invention.); *Piasecki*, 745 F.2d at 1471, 1473-74, 223 USPQ at 790 (Evidence of nontechnological nature is pertinent to the conclusion of obviousness. The declarations of those skilled in the art regarding the need for the invention and its reception by the art were improperly discounted by the Board.)...

Therefore, the expert opinions of Dr. Davis on the level of skill in the art with respect to Wideman et al. and Barthel et al., and how the claimed invention is nonobviousness in light of that level of skill cannot be ignored. Further, the Examiner has not identified any evidence of record that leaves the opinions of Dr. Davis with little weight or probative value not sufficient to overcome the rejections of record, as indicated by the Examiner at pages 4-5 of the final Office Action. Therefore, the Brandstadter case cited by the Examiner at page 4 of the final Office Action

is not instructive or controlling here in the Board's review.

In view of at least the above, reversal of this rejection is respectfully requested.

The final Office Action fails to separately and individually address any of claims 2, 3, 7-13, 15-19, and 21-27 grouped with claim 1 under this rejection. Each of these claims differ from Barthel et al. and Wideman et al. for at least the same above-discussed reasons applicable to claim 1. Additional patentable differences between these claims and Barthel et al. and Wideman et al. are discussed below.

Claim 15

Further to claim 1, claim 15 further specifies that the interfacial potential property value is determined *during* the process for producing the particulate material.

This claim was not separately addressed by the Examiner in the final Office Action. Therefore, with respect to claim 15, the Examiner has not "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007)(quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

The combined references of Wideman et al. and Barthel et al., if combinable, do not teach, suggest, or predict the success of the method recited in claim 15 on appeal.

Also, the reasons for reversal as discussed above with respect to the rejection of parent claim 1 apply equally here.

In view of at least the above, reversal of this rejection is respectfully requested.

Claim 16

Further to claim 14, claim 16 further specifies that the interfacial potential property value is determined prior to shipping the particulate material to a customer.

This claim was not separately addressed by the Examiner in the final Office Action.

The combined references of Wideman et al. and Barthel et al., if combinable, do not teach, suggest, or predict the success of the method recited in claim 16 on appeal.

Also, the reasons for reversal as discussed above with respect to the rejection of parent claim 1 apply equally here.

In view of at least the above, reversal of this rejection is respectfully requested.

Claim 21

Further to claim 1, claim 21 further specifies that the interfacial potential property value of the particulate material is determined by an interfacial potential absorptometry method comprising performing an absorptometer test on the particulate material with first and second different liquids and measuring maximum torque or volume of liquid added for the different liquids.

This claim was not separately addressed by the Examiner in the final Office Action.

The combined references of Wideman et al. and Barthel et al., if combinable, do not teach, suggest, or predict the success of the method recited in claim 21 on appeal.

Also, the reasons for reversal as discussed above with respect to the rejection of parent claim 1 apply equally here.

In view of at least the above, reversal of this rejection is respectfully requested.

Claim 23

Further to claim 1, claim 23 further specifies that the interfacial potential absorptomety method uses water, ethylene glycol, or mixtures thereof. As indicated, Examples 2, 3, and 5 (pages 22-23, 24-26) of the present application illustrate a method using the liquids recited in claim 23 to determine at least one interfacial potential property value, which can be used in the method recited in claim 1 on appeal.

This claim was not separately addressed by the Examiner in the final Office Action.

The combined references of Wideman et al. and Barthel et al., if combinable, do not teach, suggest, or predict the success of the method recited in claim 23 on appeal.

Also, the reasons for reversal as discussed above with respect to the rejection of parent claim 1 apply equally here.

In view of at least the above, reversal of this rejection is respectfully requested.

Claim 24

Further to claim 1, claim 24 further specifies a wicking rate method used as a measure of the interfacial potential of the particulate material that is carbon black or silica, wherein the interfacial potential property value is determined by a wicking rate method comprising determining a difference in wicking rate for two or more liquids into equivalent packed columns of the particulate material itself. Example 4 (pages 23-24) of the present application illustrates such a wicking rate method to determine at least one interfacial potential property value.

In the final Office Action (page 3), the Examiner has admitted that Barthel et al. and Wideman et al. are silent as to adjusting the process variable to achieve the desired characteristics of the particles and the specific testing by "wicking rate." Without citing any evidence, the Examiner refers to "notoriously well known" testing of the speed or distance that a particulate solution "wicks" (e.g., as allegedly used for paper chromatography), and apparently equates such testing with the wicking method recited in present claim 24 (final Office Action, page 4). As explained by Dr. Davis, any measurement of wicks in paper chromatography does not correspond to measurement of interfacial potential by wicking rates such as described in paragraphs [0069]-[0070](pages 23-24) of the present application, which is reflected in claim 24 (Davis Declaration, page 9, para. 12). The Examiner's assumption that any "notoriously well known" prior measurement of "wicks" is the same method as presently claimed is factually incorrect as can be

seen by comparing the wicking rate test of the present invention with paper chromatography. The Examiner does not explain how paper chromatography can be used to test the wicking rate of particulate material itself. Further, the Examiner has not set forth an apparent reason why one of ordinary skill in the art would have considered modifying any alleged "notoriously well known" wicking tests to duplicate the wicking rate method recited in present claim 24 used to determine an interfacial potential of carbon black or silica.

Also, the reasons for reversal as discussed above with respect to the rejection of parent claim 1 apply equally here.

In view of at least the above, reversal of this rejection is respectfully requested.

Claim 25

Further to claim 11, claim 25 further specifies that the interfacial potential property value of the particulate material is determined by a yield point method.

This claim was not separately addressed by the Examiner in the final Office Action.

The combined references of Wideman et al. and Barthel et al., if combinable, do not teach, suggest, or predict the success of the method recited in claim 25 on appeal.

Also, the reasons for reversal as discussed above with respect to the rejection of parent claim 1 apply equally here.

In view of at least the above, reversal of this rejection is respectfully requested.

Claim 26

Further to claim 1, claim 26 further specifies that the interfacial potential property value of the particulate material is determined by an interfacial potential vapor adsorption method.

This claim was not separately addressed by the Examiner in the final Office Action.

The combined references of Wideman et al. and Barthel et al., if combinable, do not teach, suggest, or predict the success of the method recited in claim 26 on appeal.

Also, the reasons for reversal as discussed above with respect to the rejection of parent claim 1 apply equally here.

In view of at least the above, reversal of this rejection is respectfully requested.

Claim 27

Further to claim 1, claim 27 further specifies that the interfacial potential property value of the particulate material is determined by an IGC method.

This claim was not separately addressed by the Examiner in the final Office Action.

The combined references of Wideman et al. and Barthel et al., if combinable, do not teach, suggest, or predict the success of the method recited in claim 27 on appeal.

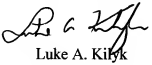
Also, the reasons for reversal as discussed above with respect to the rejection of parent claim 1 apply equally here.

In view of at least the above, reversal of this rejection is respectfully requested.

Conclusion

For the reasons set forth above, the appellants submit that the claims presently pending in the above-captioned application meet all of the requirements of patentability. It is therefore respectfully requested that the Honorable Board reverse the Examiner and remand this application for issue.

Respectfully submitted,



Luke A. Kilyk
Reg. No. 33,251

Atty. Docket No.: CBK03072 (3600-374-22)
KILYK & BOWERSOX, P.L.L.C.
400 Holiday Court, Suite 102
Warrenton, VA 20186
Tel.: (540) 428-1701
Fax: (540) 428-1720

(10) Claims Appendix

1. A method of providing product consistency for a particulate material comprising the steps of:

a) maintaining at least one morphological value of a particulate material within a first target range and

b) maintaining at least one interfacial potential property value of the particulate material within a second target range, comprising:

i) determining at least one interfacial property value of the particulate material; and

ii) adjusting at least one process variable of a process for producing the particulate material, wherein the adjustment maintains the interfacial potential property value within the second target range, wherein said particulate material is a carbon black or silica.

2. The method of claim 1, further comprising the step of maintaining at least one chemical value of the particulate material.

3. The method of claim 2, wherein the chemical value is pH or functional group level.

7. The method of claim 1, wherein the particulate material is fumed silica.

8. The method of claim 1, wherein the morphological value is surface area, particle size, structure, porosity, or combinations thereof.

9. The method of claim 1, wherein the first target range for the morphological value is within about 10% of the morphological value.

10. The method of claim 1, wherein the second target range for the interfacial potential property value is within about 50% of the interfacial potential property value.

11. The method of claim 1, wherein the step of maintaining at least one morphological value of a particulate material comprises

i) determining at least one morphological value of the particulate material; and

ii) adjusting at least one process variable of a process for producing the particulate material, wherein the adjustment maintains the morphological value within the first target range.

12. The method of claim 11, wherein the morphological value is determined during the process for producing the particulate material.

13. The method of claim 11, wherein the morphological value is determined prior to shipping the particulate material to a customer.

15. The method of claim 1, wherein the interfacial potential property value is determined during the process for producing the particulate material.

16. The method of claim 1, wherein the interfacial potential property value is determined prior to shipping the particulate material to a customer.

17. The method of claim 11, wherein the morphological value is determined by liquid adsorption, vapor adsorption, microscopy, or combinations thereof.

18. The method of claim 11, wherein the morphological value is determined by an adsorption method using iodine, nitrogen, CTAB, DBP, or paraffin oil.

19. The method of claim 11, wherein the process variable is selected from the group consisting of: combustion stoichiometry, reactor quench length, feedstock composition, primary fuel type, level of downstream additives, and post treatment conditions.

21. The method of claim 1, wherein the interfacial potential property value is determined by an interfacial potential absorptometry method comprising performing an absorptometer test on the particulate material with first and second different liquids and measuring maximum torque or volume of liquid added for the different liquids.

22. The method of claim 21, wherein the interfacial potential absorptometry method uses a liquid other than DBP or paraffin oil.

23. The method of claim 21, wherein the interfacial potential absorptomety method uses water, ethylene glycol, or mixtures thereof.

24. The method of claim 1, wherein the interfacial potential property value is determined by a wicking rate method comprising determining a difference in wicking rate for two or more liquids

into equivalent packed columns of the particulate material.

25. The method of claim 1, wherein the interfacial potential property value is determined by a yield point method comprising measuring a degree of flocculation of the particulate material.

26. The method of claim 1, wherein the interfacial potential property value is determined by a interfacial potential vapor adsorption method comprising using a gas for gas adsorption analysis, wherein said gas is selected from water gas, ammonia gas, toluene gas, or ethanol gas.

27. The method of claim 1, wherein the interfacial potential property value is determined by an IGC method.

(11) Evidence Appendix

SELECTED (ANNOTATED) TABLES & FIGURES OF APPLICATION

Example 2

¶[0065]: page 22, lines 22-32.

Table 3

Sample name	Volume @Max Torque			
	% of max DBP	EG	60% EG	Water
Plant A	97	77.1	108.8	17.15
Plant B	98.8	71.95	92.9	132.15
Plant C	97.8	72.8	90	138.35
Plant D	95.8	82.3	115.4	145.8
Plant E	100	73.5	91.9	100.35
↑31	**↑32**	**↑33**	**↑34**	**↑35**

Example 3
¶[0067]: page 23, lines 7-21.

Table 4

Sample name	Volume @Max Torque			
	% of max DBP	EG	60% EG	Water
Plant F	100	115.3	150.5	217.1
Plant G	98.3	114.0	141.5	183.95
Plant H	97.2	111.5	138.9	208.2
Plant I	97.5	114.1	139.6	226.75
↑41	**↑42**	**↑43**	**↑44**	**↑45**

Example 4

¶[0069]: page 23, line 25 to page 24, line 21.

Table 5

↓51

Analytical Properties											
I2 Number	71	85.3	88	86.5	88.6	85.7	85.8	85.8	82.2	85.9	87.9
DBPA	108	106.9	108.2	106.5	108.1	104.9	104.4	105.9	104.5	102.9	107.8
N2SA	61.8	75.6	76	75.7	75.7	73.9		76.1	73.6	74.6	77
STSA	61.4	74.7	71.7	72.2	69.6	69.4		72.8	70.3	70.1	71.3
Tint	89.3	105.5	99.2	98	99.3	104	98.1	94.1	98.3	102.9	94.8
Wicking Rates											
Water	0.0005	0.0011	0.0011	0.0007	0.0009	0.0006	0.0007	0.0006	0.0006	0.0009	0.0010
Formamide	0.0044	0.0062	0.0049	0.0039	0.0063	0.0049	0.0054	0.0029	0.0025	0.0045	0.0050
Ethylene Glycol	0.0023	0.0011	0.0012	0.0008	0.0016	0.0011	0.0016	0.0007	0.0004	0.0012	0.0015
Bromonaphthalene	0.0060	0.0023	0.0031	0.0017	0.0021	0.0017	0.0017	0.0017	0.0011	0.0020	0.0020
Pentane	0.0212	0.0046	0.0077	0.0029	0.0074	0.0091	0.0070	0.0038	0.0028	0.0049	0.0085
Tetrahydrofuran	0.0094	0.0055	0.0125	0.0047	0.0185	0.0065	0.0138	0.0062	0.0032	0.0090	0.0136

↑52

Example 5

¶[0073]: page 25, lines 9-23; ¶[0074]: page 25, line 24 to page 26, line 5.

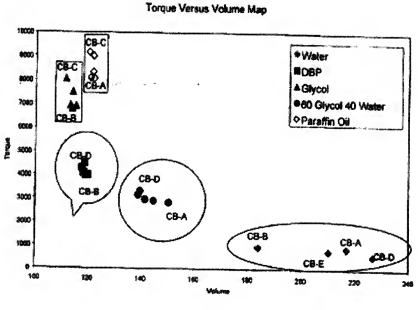


FIG 1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	REZNEK et al.	Examiner:	Lyle Alexander
Application Number:	10/649,347	Group Art Unit:	1797
Filed:	August 27, 2003	Confirmation No.:	4170
Docket No.:	CBK03072 (3600-374-22)		

For: METHODS OF PROVIDING PRODUCT CONSISTENCY

DECLARATION UNDER 37 C.F.R. § 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, the undersigned declarant, Sheldon B. Davis do hereby declare and state:

1. I am not a named co-inventor of the invention described and claimed in the above-identified patent application.

2. I am familiar with the subject matter, contents, and relevant portions of the prosecution history of the above-identified application including the Office Action dated February 26, 2009, and the references discussed therein, including U.S. Patent Number 6,800,413 B2 to Barthel et al. ("Barthel et al.") and U.S. Patent Number 6,348,539 B1 to Wideman et al. ("Wideman et al.").[1]

3. I received a Bachelor of Science degree in chemical engineering in 1995 from North Carolina State University and my doctoral degree in chemical engineering in 1999 from the University of Arizona. I am a member of the American Association of Aerosol Research and the

[1] I have been informed by one of Cabot Corporation's patent attorneys of record in this patent application that the "Okado et al." reference mentioned in the Office Action of 2/26/2009 can be disregarded, based on clarifications received from the Examiner by telephone since the Office Action.

AiChE, as well as a member of the advisory committees for the Chemical Engineering Department at Northeastern University and Arizona State University. I am an author or co-author on numerous technical publications pertaining to chemical engineering, especially combustion processes.

4. After completing post-doctoral research at the University of Arizona, I held the position of Research Engineer, Applied Research and Development, at Praxair Incorporated (Tarrytown, NY). In 2001, I joined Cabot Corporation, where I have held several positions over the intervening years: Research Engineer, Rubber Blacks Division (2001-2002), Senior Research Engineer, Rubber Blacks Division (2003-2004), Research Project Leader, Fumed Metal Oxides Division (2005-2007), Manager, Process Group, Fumed Metal Oxides Division (2007), and Manager, Process Research and Development, Performance Segment (2008-present). I have over 15 total years experience in various capacities relating to research, development, and production of particulate materials in general and carbon black products in particular.

5. In view of at least the facts set forth above and referenced in paragraphs 1 - 4 above, inclusive of my indicated combined educational and industry experience, I believe that I should be considered an expert in the field of particulate material technology, including but not limited to carbon black and silica technologies.

6. My understanding of the present invention is based on at least the following factual information and my observations thereon. As explained in the present application, the present invention relates to resolving a problem associated with carbon black and silica particulate material production in which particulate materials that seemingly were made "within spec" with respect to one or more measures of morphology, such as particles size, surface area, structure, porosity, etc., do not perform consistently as expected in end-use or intermediate-use

applications of the particulate material. Prior to the present invention, the industry was perplexed about why this was happening. Trying to resolve the problem at the customer level is problematic. Ideally, the carbon black or silica particulate material that leaves the production plant will perform as specified, and non-compliant materials would be identified and resolved before a product reaches customers. In this context, the present inventors discovered that such particulate materials can be evaluated in terms of a different modality of measurement - an interfacial property value measurement - which can be used to more reliably reveal whether particulate material is actually within spec or not for an application. If determined to be necessary from the interfacial property value measurement, adjustments can be made in the production of the material to maintain the interfacial potential property value of the particulate material within a target range. As defined in the present application, the interfacial potential of a particulate material is defined through a measure of a physical phenomenon that depends on the interaction of particulate material with other materials or with itself, after the effects of morphology have been removed (e.g., application paragraph [0024]). As also explained in the present application, when two particles are in contact with each other the interfacial potential is the cohesion per unit area of contact, and, when particulate material is mixed into a fluid, the interfacial potential is the adhesion per unit area of the particle. If the measurement is per unit mass then the total interaction depends on the surface area per unit mass and the interfacial potential per unit area. The interfacial potential property value may be any property that can be correlated to the interfacial potential of the particulate material. I note that examples of the present application demonstrate that morphological values can appear to indicate that particulate materials are within spec, while the added interfacial potential property measurements serve to reveal which of those particulates will perform inconsistently when applied. Based on this information provided in the present application, my opinion is that a person skilled in the art

would not equate or confuse an interfacial potential property value with a conventional morphological value.

7. As a result of the discovery of the present inventors, my view is that the present invention can provide quality control and/or quality assurance for the particulate material before it reaches end-product or intermediate produce users, which can make it easier for a customer to obtain consistency in their end products and any intermediate products containing the particulate material, such as polymer products, elastomeric products, inks, coatings, toners, and the like. The claims of the application, such as set forth in the Amendment filed on December 12, 2008 by the applicants, reflect these and other features of the present invention. Present claim 1 of the above-identified application, for example, recites a method of providing product consistency for a particulate material comprising the steps of: a) maintaining at least one morphological value of a particulate material within a first target range and b) maintaining at least one interfacial potential property value of the particulate material within a second target range, comprising: i) determining at least one interfacial property value of the particulate material; and ii) adjusting at least one process variable of a process for producing the particulate material, wherein the adjustment maintains the interfacial potential property value within the second target range, wherein said particulate material is a carbon black or silica. Several approaches to practicing the general concept of claim 1 are also claimed in the present application. For example, claim 24, recites, in part, that the interfacial potential property value is determined by a wicking rate method comprising determining a difference in wicking rate for two or more liquids into equivalent packed columns of the particulate material. Other methods are also recited in other claims, such as an interfacial potential absorptometry method as recited in claim 21, a yield point method recited in claim 25, and interfacial potential vapor adsorption method recited in claim 26.

8. Despite the above-identified technical breakthrough of the present inventors, I understand that the Examiner has made an obviousness rejection of claims 1-3, 7-13, 15-19, and 21-27 of the present application under 35 U.S.C. § 103(a) based on each of the above-identified U.S. patent references to Barthel et al. and Wideman et al. in his most recent Office Action dated February 26, 2009. In making this rejection, the Examiner states that Wideman et al. teaches "a method of making a composition comprising carbon black, silica and metal oxide particles in specific size ranges ... [t]orque and BET values monitored to determine the desired characteristics of the composition and have been read on the claimed combination of '*morphological values*' and '*interfacial potential properties*'" (Office Action of 2/26/2009, page 2). The Examiner further states that "the instant claim language is sufficiently broad and not specific to the state of matter of the particles and has been properly read on the polymerized particles taught by Wilderman et al. [*sic*]" (Office Action of 2/26/2009, page 5). The Examiner states that Barthel et al. teaches "a method of preparing carbon black and silica at the specific BET - method surface area (DIN 66131 and 66132) where these characteristics are determined by gas adsorption or inverse gas chromatography ... [t]he taught 'BET' has been read on the claimed combination of '*morphological values*' and '*interfacial potential properties*'" (Office Action of 2/26/2009, page 3). The Examiner also is understood to urge that "the Office maintains the taught BET is indistinguishable" from measurements of interfacial properties as described in paragraph [0043] of the specification, and that "the specific limitations of paragraph [043] [*sic*] are presently not claimed" (Office Action of 2/26/2009, page 5). In making these rejections, the Examiner also states that "Barthel et al. and Wideman et al. are silent to the claimed ranges of the morphological values within about 10%, the interfacial potential property value within about 50% and adjusting the process variables to achieve the desired properties ... [i]t would have been within the skill of the art to further modify ... Barthel et al. or Wideman et

al. and adjust at least one process variable to achieve the desired result" (Office Action of 2/26/2009, pages 3-4). With respect to testing by "wicking rate," the Examiner states "[t]esting a particulate material by the speed or distance the particulate solution 'wicks' is notoriously well known in the art (e.g. for example [*sic*] paper chromatography)" (Office Action of 2/26/2009, page 4), and "the Office maintains the claims are sufficiently broad to have been equated to chromatography wicking" (Office Action of 2/26/2009, page 6).

9. With respect to the Barthel et al. reference, based on my review I observe that Barthel et al. relates to low-silanol silicas that are designed for various uses including emphasis placed on their use in developers and toners, e.g., magnetic and nonmagnetic toners, used for printing/reproduction and image transfer processes (e.g., col. 11, line 43 to col. 12, line 29). I observe that the Barthel et al. reference indicates that the silica is used as an additive to prevent caking, clumping, or reagglomeration and keep powders flowable, as a rheological additive, and as a reinforcing filler (col. 11, lines 29-42, col. 11, line 64 to col. 12, line 11). In this respect, my opinion is that Barthel et al. is describing purposes for the silica that merely relate to physical or morphological properties of the product, such as toners. Based on my experience with carbon blacks and other particulate materials designed and used for print developers and toners, those materials have not been conventionally designed using concepts of an "interfacial potential" of the particles (as that terminology is defined in the present application), nor has any connection previously been made in the toner arts between interfacial property and quality control for end-product performance. Based on my review, Barthel et al. does not teach or suggest that interfacial potential (as defined in the present application) of silica or carbon black is a results-effective parameter for those materials that achieves a recognized result. I also observe that Barthel et al. fails to appreciate the importance of maintaining at least one interfacial potential property value of a particulate additive within a target range, in addition to maintaining at least

morphological value of the additive within a target range, in order to avoid the problem of a particulate additive that appears to be within spec, but a product incorporating the additive does not perform as expected or predicted. As I have noted above, the examples of the present application demonstrate that morphological values can appear to indicate that particulate materials are within spec, while the added interfacial potential property measurements can uncover which of those will perform inconsistently when used in an application. I do not see where Barthel et al. teaches or suggests this discovery expressly or by accident.

10. Based on my experience with BET analysis as conventionally used in the particulate material industry, I explain that it is well known in the particulate material industry that the measurement of gas adsorption by the DIN standards 66131 and 66132 as described and used in Barthel et al. involves measuring the adsorption of nitrogen or krypton as an inert gas for purposes of the measurement. My opinion is that these conventional standards for BET analysis used by Barthel et al. provide only a measurement of surface area as a morphological property of the tested material. Surface area measurements, such as conventional BET analysis conducted using an inert gas such as nitrogen or krypton, are routinely used in the industry as estimates of average particle size. Based on my knowledge and experience in this art, such conventional BET analysis used in Barthel et al. has not been used by researchers or technicians in the field to measure "interfacial potential" of particles as that terminology is defined in the present application (e.g., paragraph [0024]), nor would it inherently provide such information. Also based on my review, I note that paragraph [0043] of the present application explains that alternative gases, such as water, ammonia, and various organic vapors such as toluene and ethanol, to the common "inert gases," can be used for BET analysis for determining interfacial potential according to methods of the present invention. Based on my review, Barthel et al. does not describe use of any of these alternative gases for BET analysis by the DIN standards 66131 and 66132. In view of these facts, my technical opinion is that

Barthel et al. uses a different BET test for a different purpose than the present invention. It also is my opinion that Barthel et al. does not teach or suggest how a standard BET analysis according to DIN 66131 and 66132 may be modified to provide a measure of interfacial potential as recited in the present claims, nor that such a modification, such as substituting one of the above-mentioned "alternative gases" for a BET analysis as described in the present application for the conventionally used gases for BET analysis, would be expected to yield a predictable result from a technical standpoint.

11. With respect to the Wideman et al. reference, I observe that Wideman et al. relates to use of silica as a filler for tire tread rubber. I also observe that Wideman et al. measures surface area of the silica using a conventional BET method, as measured using nitrogen gas, as a morphological property measurement (e.g., col. 4, lines 41-47). I refer to and incorporate my foregoing remarks on why conventional BET analysis, such as also used by Wideman et al., will not provide a measure of interfacial potential as defined in the present application. Further, torque is measured by Wideman et al. on a compounded rubber sample and not the particulate material itself (col. 8, line 55 to col. 9, line 4). I observe that implementation of quality control at the filled product (compounded rubber) level, such as in Wideman et al., overlooks the potential serious problem of particulates made "within spec" which nonetheless perform inconsistently in applications. Wideman et al., like Barthel et al., fails to appreciate the importance of maintaining at least one interfacial potential property value of a filler within a target range, in addition to maintaining at least morphological value of the filler within a target range, in order to avoid the problem of a filler that appears to be within spec but the product incorporating the filler does not perform as expected or predicted. I do not see where Wideman et al. teaches or suggests this discovery expressly or by accident.

12. With respect to the Examiner's above-noted assertion made in the most recent Office Action that the claims of the present application are sufficiently broad to have been equated to chromatography wicking, my technical opinion is that the Examiner's conclusion in this respect is not supported by facts and is flawed for at least the following reasons. I note that claim 24, for example, of the present application recites a wicking rate method used as a measure of the interfacial potential of the particulate material that is carbon black or silica, wherein the interfacial potential property value is determined by a wicking rate method "comprising determining a difference in wicking rate for two or more liquids into equivalent packed columns of the particulate material". Example 4 (paragraphs [0069]-[0070]) in the present application illustrates this embodiment. Based on my knowledge of both packed column chromatography and paper chromatography, I point out that any measurement of wicks in paper chromatography does not correspond to measurement of interfacial potential by wicking rates such as described and claimed in the present application. Paper chromatography, as well known in the chemical arts, is a method conventionally used to separate compounds from a mixture for identification. The separated substances on the chromatography paper form a color pattern called a chromatogram. As well known, each pigment or compound of the mixture being tested by a paper chromatography method will have a unique rate of migration (Rf) value that scientists can use to identify the substance. As such, paper chromatography is not a measurement of an interfacial potential property value as defined for the present application. Further, I observe that the Examiner has not set forth an apparent reason why one of ordinary skill in the art would have considered modifying any "notoriously well known" wicking tests to duplicate the method of present claim 1, or, particularly, the wicking rate method such as recited in present claim 24, where the interfacial potential property value of a carbon black or silica is determined by the method, not the identities of different compounds in a mixture.

13. In view of this evidence including my opinions, it is my opinion that one of ordinary skill in the art would not have found the invention of the present application, such as recited in any of claims 1-3, 7-13, 15-19, and 21-27, to be *prima facie* inherent to or obvious at the time of the invention in view of Barthel et al. or Wideman et al.

14. I also understand that the Examiner has rejected claims 21-23 and 25-26 of the present application under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement, in his Office Action of February 26, 2009. The Examiner is understood to state that the original specification does not describe the new amendments to claims 21, 25 and 26 as the Patent Office "did not find literal support" (Office Action of 2/26/2009, page 2). Based on my review of the original disclosures of the present application and the claims in question, it is my opinion that the disclosure of the present application conveys with reasonable clarity to persons skilled in the art of particulate material production that the present inventors, at the time of filing their application, had fully conceived and possessed the subject matter recited in claims 21, 25, and 26, and any claims depending from them, as recited in the applicants' response filed December 12, 2008. In particular, based on my review and expertise, it is my opinion that amended claim 21 recites the use of an interfacial potential absorptometry method, which in my opinion is described in a comprehensible and supported manner to a person skilled in the art in the present application as filed at, for example, paragraphs [0047], [0062], [0065], [0067], and [0074]. Also based on my review and expertise in the relevant art, it is my opinion that amended claim 25 recites the use of a yield point method, which a person of skill in the pertinent field would consider comprehensible and supported, for example, at paragraph [0049] in the present application as filed. Further, based on my review and expertise in the relevant art, it is my opinion that amended claim 26 recites the use of an interfacial potential vapor adsorption method, which a person skilled in the pertinent would consider comprehensible and supported, for example, at

paragraph {0043} in the present application as filed.

15. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the instant application or any patent issuing therefrom.

26 August 2009
Date

Sheldon B. Davis

(12) Related Proceedings Appendix
None.